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A CONTRIBUTION TO THE LIFE HISTORY OF THE COMMON (*Sterna hirundo*) AND ROSEATE (*S. dougalli*) TERNS.

BY LYNDS JONES.

THE COMMON TERN.

We are more indebted to Mr. George H. Mackay than to any one other person for what is known of the life history of this tern, as well as of the life history of the several species of the gulls and terns which breed on the coast of Massachusetts. Mr. Mackay's extended studies have appeared in volumes 12 to 16 inclusive of The Auk. I shall not repeat the points in the life history of this species which he has fully covered, but attempt to supplement what he has given, and to indicate changes in habits where they may have occurred in the interval between his studies and mine.

The studies upon which this paper are based were carried on during parts of the summers of 1903 and 4, with Woods Hole, Massachusetts, as a base of operations, and with all of the facilities of the Marine Biological Laboratory, and the United States Fish Commission at my command. To the directors of these two institutions my thanks are heartily tendered.

From July 8 to August 14, 1903, and from June 28 to August 12, 1904, the terns were under almost constant observation. Intensive studies were conducted at the Woepecket islands and on Muskeget island. The colonies on Penikese and

on No-mans-land islands were visited several times where comparative studies were made. Three visits to the colonies on the three Chicken islands and on North Harbor island in Lake Erie, enabled me to compare marine and inland colonies.

Muskeget island is typical of the low sandy islands to which the Woepeckets and a part of Tuckernuck belong. Such islands are covered with a growth of bunch grass and poison ivy, and with other vegetation of less consequence and relatively slight in quantity. The bunch grass forms dense masses in some places, but in others is in scattered bunches, and there are areas of some extent devoid of any vegetation. The broad beach is either sandy with few or no stones, or composed of boulders ranging from the size of pebbles to several tons in weight. Driftwood and sea weed are found everywhere. Penikese island is typical of the high islands which are covered with a strong turf with little or no other vegetation except on the islands of large area where forests maintain themselves with all the attendant vegetation. Of course the terns and gulls frequent only the borders of forest covered islands, and in the vicinity of Woods Hole are largely confined to Penikese, No-mans-land, and the outlying parts of Martha's Vineyard at the ocean end of Katama Bay.

Mr. Mackay states that but one brood is reared in a season. There is good evidence for believing that two broods are raised by a considerable proportion of the Common Terns. About June 10th nests with eggs are the most numerous, according to Captain Gibbs of the Life Saving Station on Muskeget island, and also Special Policeman Small of the same island. Also according to these gentlemen, there is a second maximum time for eggs, which occurs about July 10th. My observations corroborate this view. Upon my arrival on June 28, 1904, very few nests containing eggs were to be found, while two weeks later nests with eggs were found everywhere.

Mr. Mackay records very few nests containing 5 eggs, and inclines to believe that in exceptional cases one bird may have deposited all five eggs. I found three nests which contained 6 eggs, and a considerable number which contained 5. In every case where the nest contained more than 4 eggs it was

clear that two females had laid to the same nest. This was proved by the marked difference in the degree of incubation of two or three of the eggs from the rest in the nest, or by the marked difference in size and markings and texture of the shell. In a relatively small proportion of cases nests containing four eggs were clearly mixed sets. While many nests contained but one egg, I never met with a case where the single egg could be regarded as a nest complement. Either another or other eggs were laid in the nest later, or the nest proved to be deserted, or the egg was infertile and remained after the others had hatched. The usual number of eggs or young was

COMMON TERN. (Sterna Hirundo.)
Egg, Young Just Hatched, Young Two Days Old.
Woepecket Id., Mass.

three, but there were many nests with two eggs or young, and a somewhat smaller number with four eggs or young.

Contrary to many statements, I have never met with a case of no nest material in the case of this tern. A freshly made nest is usually a well constructed cup of dry grass, or dry drift seaweed, or other dry trash, arranged loosely in a depression in the sand, on drift seaweed, or among the beach pebbles or stones. The material is definitely arranged and pressed down to smoothness by treading and by pressing the breast against the nest material. Exposed nests are pretty certain to have most or all of the nest material blown away before the chicks leave the nest.

Nests are placed practically anywhere on the ground. The sandy beaches as well as the gravelly and stony exposed beaches are occupied, but there seems to be a marked tendency for the birds to prefer the upper reaches of the islands, placing the nests among the grasses and bushes and vines, but without attempts at concealment. On the Woepecket islands, however, where great boulders of several tons weight are scattered along certain parts of the beach, several nests were found beneath these boulders, or even placed well back in crevices or littles caves. The birds seem to demand a fairly broad outlook from the nest. The upland parts of Penikese island are covered with a strong turf which supports a luxuriant growth of grass. Among this grass the terns' nests are often raised from the ground by the thick matting of last year's growth.

Mr. Mackay states that wherever the nest may be placed the tern selects material which harmonizes with the surroundings. I have not found that to be true in enough cases to indicate any suggestion of intelligence on the part of the bird. Nests placed among the rubble of the beach are hard to see because the eggs resemble the pebbles, making the nest appear to be a wisp of drift. Nests placed on the light gray sand or grass are conspicuous objects, since both nest material and eggs form a strong contrast with the surroundings. It would seem, therefore, that the upland and sandy reaches nesting habit was a late acquisition, and that the birds have not yet fully adapted

themselves to the different environment which these places afford.

The eggs are generally deposited on successive days, rarely a whole day intervening between the deposition of two eggs. Incubation begins when the first egg is deposited, and the eggs hatch in the order in which they were deposited. The period of incubation for six nests studied was 21 days, or the same as for the domestic fowl.

Both male and female take regular turns sitting, but my observations indicate that the female spends more time on the nest than the male. In the cases studied, a bird later found to be the female, approached the nest abruptly and settled upon the eggs without any preliminaries. She remained quiet 40 minutes, when she uttered a peculiar call which was repeated at short intervals until a bird separated itself from the hovering cloud, or company at the water's edge, when she stood up, took a few steps, and flew away. The male alighted on the sand several rods to leeward of the nest and approached it gradually, simulated feeding, and called loudly at intervals. When he reached the nest he merely stood over the eggs to protect them from the scorching rays of the sun, and kept calling at intervals. In 20 minutes he became more restless, called more frequently, and soon ran some distance to windward of the nest and took wing. Within a few minutes the female alighted on the sand near the nest and went abruptly to it and settled upon the eggs. This maneuver was repeated many times, with slight modifications. Upon the slightest disturbance the birds leave the nest and circle about overhead, calling excitedly and loudly, often making sallies at the head of the intruder. At first it seemed impossible to select the parents from the other scolding birds which constantly hovered over me, and since one can seldom find a nest which is sufficiently isolated to enable one to concentrate attention upon it alone, there might well be confusion as to the owners of any given nest. But with the young the case is more definite. When a young bird is picked up, two of the hovering birds become much bolder than the rest, dashing within a few feet of the intruder. After considerable careful study it became

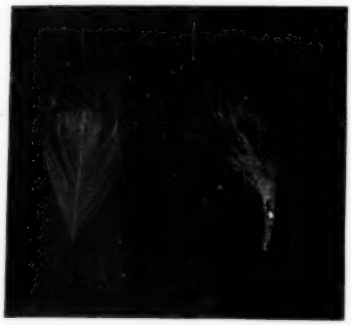
evident that while there is always a community of interest in the whole colony the aggressive protest against the intruder is confined to the birds immediately interested. In cases of doubt as to whether the nest under observation was that of *hirundo* or *dougalli* it was only necessary to remain quietly near the nest until all but one or two of the birds tired of the demonstration of hostility. The female was invariably the more aggressive.

Not much of the incubation of the eggs is left to the heat of sun and sand, but the birds brood almost constantly. Eggs left exposed to the sun for any considerable time die. A large number of eggs do not hatch. Some are evidently infertile, but many die from lack of proper care. Incubation evidently begins when the first egg is laid.

The first feather rudiments appear as little swellings upon the skin surface on the fifth day of incubation. By the tenth day they have greatly elongated and turned backward to lie parallel to the skin surface, many of them being pigmented. These rudiments of the first or nestling downs appear first on the tail, then successively forward to the forehead along the feather tracts, except that in the region of the large wing feathers they begin to appear at about the time when those on the lower back are first seen. On the 18th day of incubation the down feathers in the region of the outer primaries begin to show enlarged bases beneath the skin. These enlargements are the beginning of the future juvenile flight feathers. When the bird hatches its down feathers are unexpanded and look like wet hairs plastered against the skin. They remain in this condition during the first day after hatching, but on the second day the enclosing sheath dries and splits and the liberated and dried down barbs expand and cover the skin surface with a soft, fluffy plumage. On the third day after hatching the flight feathers appear at the surface of the skin and in their further growth push the down feathers out of their pockets. At first the new feather is enclosed by a horny sheath which keeps it in the "pin feather" form, with the tuft of down sticking to its pointed tip. In three or four days the horny sheath dries and splits away from the tip and the new feather flattens out into

a perfect feather. The down is seen to form a fringe along the tip of the flattened feather (Fig. 3), each down barb being attached to one or more of the barbs of the new feather. This down fringe wears off rapidly on all exposed parts, but is sometimes found in protected places on young birds some days after they begin to fly about. The young bird can fly feebly by the eighth day after hatching.

Figure 3.



Juvenile definitive feathers of *S. hirundo* with down barbs attached to their tips.

The embryo, on the 18th day of incubation, lies doubled up in the egg, with the head turned under the body resting on the abdomen, just in front of the elongated yolk sac. The bill is thrust between the right knee and elbow, inclining slightly toward the body, the left foot touching the neck, just back of the ear, the right foot resting on the forehead, almost touching the right eye.

By the 18th day of incubation the shell is cracked in one or more places near the large end. The cracks are radially arranged in areas, and are clearly produced by pressure upon the shell from within. Examination reveals the fact that beneath each cracked area lies some protruding part of the embryo—the knee, bill, or shoulder—which is in contact with the shell when the embryo has a muscular contortion. A faint peeping can be heard at this time.

On the 19th, in a few instances on the 20th day of incubation, the shell was found broken through by the tip of the bill for a space the diameter of the tip of the bill. This break was usually near the center of the first seen cracked area. I did not find any instance in which this air hole was materially enlarged, nor any instance in which any other holes were made in the shell. On the 21st day of incubation the muscular contortions of the chick resulted in bursting off the entire large

end of the egg. The chick then readily wriggled himself free from the remainder of the shell. The yolk sac is drawn into the body and closed at the end of the 20th day of incubation.

During the first day after hatching the young bird lies in an apparently exhausted condition, and receives no food. Feeding begins on the second day. Late hatched young are likely to be attacked by myriads of the little red ants which infest the islands, and many are killed by them.

Regurgitation is never practiced by this tern. The fish, here usually the sand lance (*Ammodytes americanus*), is caught in the water and is held by its middle while it is being carried to the waiting young. The fish is deftly turned head toward the chick and thrust into its mouth or even pushed down its throat. The size of the fish did not necessarily bear any relation to the size of the chick. It was no uncommon thing to find a two-day-old chick peacefully sleeping in the nest with an inch or more of fish protruding from its mouth. It was forced to eat its fish by intallments! Several fishes forcibly removed from protesting young had the head and upper part of the body digested, while the tail region was still exposed to the air.

The young usually remained in the nest for the first three days, but on the fourth day they left it but remained near. Young hatched in nests placed among thick grass, as on Penikese island, remain in the vicinity of the nest until they can fly away from it. Here there are paths trodden in the grass, radiating from the nest in several directions, but seldom farther than a rod from the nest. The young are fed by the parents or parent until some time after the young are able to fly about and accompany the old to the fishing grounds. I have never seen a young bird fed while both birds were flying. Invariably the young, at least, settles upon the water before receiving the fish, and shakes his plumage as from defilement after receiving it.

I have never seen either the young or old birds eat the remains of the egg shells, nor have I ever found remnants of the shells in the digestive tracts of the birds, but I have found shells from which young had unmistakably escaped in the water where they could not possibly have been blown by the wind.

Shells are not left in the nest, and there is some evidence for believing that the old birds remove them and carry them some distance before dropping them.

How do the old birds recognize their own young among the multitude of young birds congregated on the beach? was a question which occupied a good deal of my attention and interest. After the young leave the nest and its vicinity they wander about aimlessly and may be at widely different places at two visits of the old birds. Hence it often becomes a serious question on the part of the parent how to find its offspring. Abundant opportunity was afforded for studying this question. Old birds with young which had left the nest, when coming in with a fish, stooped to examine each group of young in turn until a young bird, apparently its own, was found, when the old bird alighted. Immediately the youngster began to dance and call vociferously, but not until the old one had touched the young one with its forehead was the question decided. Often this minute inspection was immediately followed by the departure of the old bird without delivering the fish, the quest for its own young being renewed. It thus became clear that sight alone was not depended upon for recognition, but that the final decision rested upon the sense of smell. Sometimes the quest resulted in failure, when the old bird swallowed the fish. The evidence seemed to indicate that these terns feed only their own young.

THE ROSEATE TERN. (*Sterna dougalli*)

I found the Roseate Tern breeding only on the Woepecket, Penikese, and Muskeget islands. Everywhere their numbers were far less than those of the Common Tern. On the Woepeckets they were largely confined to the two smaller islands, on Penikese to the north-eastern border and on the sand shoal locally known as Little Penikese, and on Muskeget to the narrow neck extending toward the long sand pit of Tuckernuck.

This tern seems to be far more fastidious about its nesting than the Common Tern. I found no nests that were not in the midst of grass, and the nest is generally well hidden by a covering of grass. In such situations the nests are more diffi-

cult to find, and the finer spotting of the eggs renders them less conspicuous in the shade of the grasses.

Only two nests were studied to the completion of the incubation period, but these had an incubation period of 21 days. In general the habits do not differ from those of the Common Tern. Their instincts inclined them to be more wary, but they were more courageous when their nests or young seemed in danger. An outraged pair would even follow the intruder from one of the Woepecket islands to the other, fighting all the way.

THE PLUMAGE OF S. HIRUNDO AND DOUGALLI.

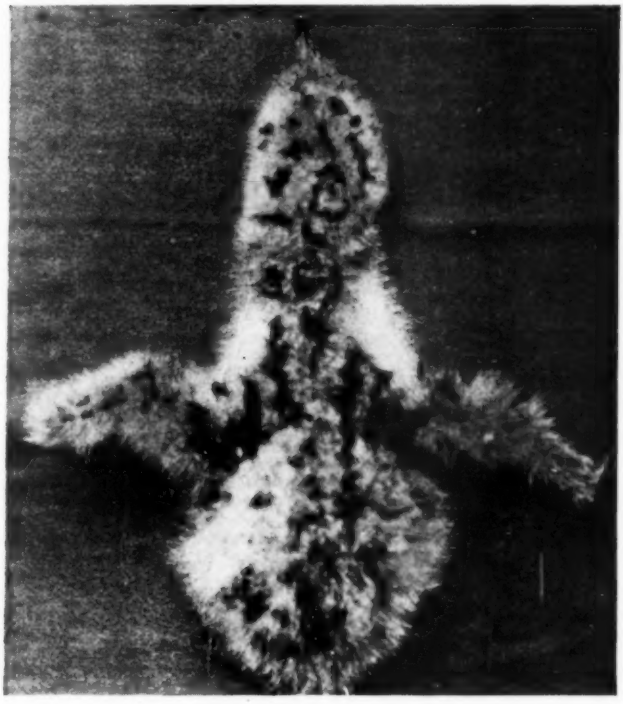
Any such study would lack completeness that did not mention the plumages of the downy young and the young birds in their first definitive feathers.

The downy young of *hirundo* is mottled with tawny and black or dusky, the mottling varying within small limits with the individual. The whole throat is dusky, but the rest of the under-parts are pure white. The expanded, fluffy down feathers form a complete covering for the body, but they grow only in the feather tracts which are characteristic of the terns. Figure 4 illustrates the pattern of mottling. This pattern seems particularly well adapted for the concealment of the chick among the rubble of the beach or upon the drift seaweed. On the gray sand or among the yellowish grass, however, the young is readily detected because its colors are here contrasty. While the young remain in the nest they seldom show fear, but raise their heads and open their mouths for food.

The downy young of *dougalli* are tawny *streaked* with dusky. One could not confuse this pattern with that of the downy young of *hirundo*. The legs of the young *hirundo* are coral red or lighter, while the legs of the downy young *dougalli* are invariably almost black. The streaked pattern of the *dougalli* chick renders the bird almost invisible in the grass covered nest. The young of *dougalli* flatten themselves down into the nest in apparent fear upon the approach of an intruder. When they leave the nest they hide away under the grass. Their difference in color pattern seems to go with a difference in disposition.

The young in his first definitive feather plumage is, in *hirundo,* barred across the back and wings with dusky brown and rufous. The main body of the feather is "gull blue," its distal end is rufous-brown for the space of several millimeters in width, and between this rufous brown distal margin and the field of "gull blue" there is a crescent of black which is very

Figure 4



Common Tern (*Sterna hirundo*). Downy young, three days old.

variable in extent. Enough of the feather is exposed to show the three colors mentioned above. The combined effect is a distinct barring of the color pattern of the upper parts. The entire under parts are pure white. In *dougalli* the pattern is more varied and is well illustrated by figure 1. Here the black tends to form more than one bar.

The habits of the partly fledged young, before they are capable of flight, lend color to the supposition that these color patterns are protective in nature.

I could discover no evidence, however, to prove that the young birds are conscious of the protective nature of their color patterns. The downy young usually squatted and "froze" when the parent uttered the alarm cry, and the partly fledged young usually ran to hide—invariably trying to crawl under something.

The streakiness of the *dougalli* downy young harmonizes with the shadows which the grass overhanging the nest cast. After they leave the nest they are difficult to see beneath it, because the colors and pattern of the downy plumage harmonize well with the grass and shadows. The blotchiness of the *hirundo* downy young harmonizes with the rubble of the beach and, while there is more contrast with the grass in which some are found than with the downy young of *dougalli,* there is yet harmony enough to make the young bird inconspicuous while it is still.

The juvenile *hirundo* hides, or tries to hide, like the Ostrich —by thrusting its head beneath the grass cover. Its head is nearly black with a light colored frontlet, while the barring of the rest of the upper parts with tawny and dusky or black harmonize with the grass beneath which the head is thrust. Persons who had not studied the terns in their nesting places were unable to see the young when so placed. Under broad leaved plants these young were readily seen after the leaves had been parted. The juvenile *dougalli* pushes himself completely beneath the grass or leafy retreat. When the covering is partly removed his peculiar pattern of barring and mottling makes him inconspicuous. His habit of moving toward deeper cover when his hiding place is disturbed betrays him.

The pure black crown, pure white under parts, and clear "gull blue" upper parts of both of these terns in adult plumage is well known. If there be any protective coloration in the adult pattern it must be while the birds are a-wing, for they are conspicuous objects when a-light.

The color pattern of the downy young is outlined when the down feathers first make their appearance upon the skin surface of the six-day embryo. That is, the pigment begins to develop in the down feathers which are to be black almost as soon as the feather papilla appears upon the skin surface. An entire down feather is seldom all one color, but those which are black at the tip are tawny in the middle and black at the base, and those which are tawny at the tip are also black at the base. This applies only to the down feathers of the dorsal surface. There are many down feathers on the ventral surface which are wholly white.

Taking the three plumages as illustrating a process of evolution of color pattern, and taking the streakiness of the downy young of *dougalli* as the more primitive, we may readily perceive that longitudinal stripes of color break up into transverse bars, and the bars give place to a uniform distribution of color. In the evolution of the present adult coloration of the terns of the genus Sterna, it seems probable that a primitive longitudinal streaking became broken up into longitudinal series of spots which were arranged in transverse series so as to give the appearance of broken bars; these series of spots extended laterally, fused, and so became in reality transverse bars, which, spreading and finally fusing, resulted in the uniform coloration of the dorsal region in Sterna adults. Such a transition would be in complete conformity to the law announced by Eimer ('82).

A PRELIMINARY LIST OF THE BIRDS OF SENECA COUNTY, OHIO.

BY W. F. HENNINGER.

The need of a new county list of birds in Ohio may be questioned, with two excellent state lists—Jones' and Dawson's—of recent issue; but it is only after every county in the state has been worked over with care that we shall feel warranted in saying that any list is more than preliminary in character. And if this county list, though by no means exhaustive

or complete, shall help just a trifle in clearing up some interesting points of distribution, migration, breeding habits, and life histories of the birds of Ohio, it will have fulfilled its purpose. While the four years of the writer's work in the county, from July 26, 1902, to June 1, 1906, is but a short time, and his impaired health during the winter, his frequent absence from his field of work, and his otherwise busy life, have made it impossible to do justice to the work, this list is the first effort at systematic ornithological work in the county.

Seneca county belongs to the tier of counties along the parallel of 41 °, and has more soil under cultivation than any other county in Ohio, in contrast to Scioto and Pike counties, my former field of work, in which the wooded area exceeds the arable. Seneca county was once covered with dense woods and swamps, of which no large tracts of woods remain; and of swamps nothing but insignificant pools remain, even the large Bloomville marshes in the south-eastern part of the county having been tiled and drained. These crowded conditions cause a great concentration of bird life during the migration season.

The county is level, a few ravines only being found in the northern and southern parts in close proximity to the Sandusky river, which divides the county into two almost equal parts with Tiffin as the center.

The climate is rather unhealthful; the excessive moisture of the atmosphere causing the summer heat to be very oppressive and the winter's cold to cleave bone and marrow. The great amount of snowfall accounts for the small number of residents and winter visitors among the birds.

Practically the entire county has been worked over with the exception of the south-eastern corner, the immediate neighborhood of Tiffin naturally coming in for the greatest amount of attention. The information has been gleaned from the writer's field work and his own and several other local collections, notably that of the Heidelberg University, which he relabeled and rearranged in the fall of 1904. While these collections show that the birds in question have been taken in the county, they are greatly deficient in exact and sufficient data.

The same painstaking care is exercised in determining the species as that exercised in the writer's List of the Birds of Middle Southern Ohio (Wilson Bulletin, September, 1902).

It would not be proper to publish this list without making grateful acknowledgment to Prof. E. M. Kleckner, of Heidelberg University, Mr. Hergenrather, of the Tiffin Fire Department, and my indefatigable young friend, Mr. Karl J. Heilmann, of the Tiffin High School, for much efficient help rendered the writer in many ways.

1. **Colymbus auritus.**—Horned Grebe. A rather rare winter visitor. One shot December 20, 1902.

2. **Podilymbus podiceps.**—Pied-billed Grebe. A rare summer resident, but abundant transient. Middle of April to October 6, 1902.

3. **Gavia imber.**—Loon. A rare transient, more common in former years.

4. **Gavia lumme.**—Red-throated Loon. November 7, 1904, one was observed for ten minutes on the Sandusky river, then shot at, when he flew away.

5. **Larus argentatus.**—Herring Gull. Abundant spring tran-transient. April 1 and 2, 1904. Not seen in fall.

6. **Larus philadelphia.**—Bonaparte Gull. Not common spring transient. April 1 and 2, 1904 Not seen in fall.

7. **Sterna hirundo.**—Common Tern. Occasional spring migrant. 1904.

8. **Phalacrocorax dilophus.**—Double-crested Cormorant. Two records, one about thirteen years ago, one shot in spring of 1902.

9. **Pelecanus erythrorhynchos.**—American White Pelican. Two records. See Wilson Bulletin No. 53, December, 1905, page 126.

10. **Merganser americanus.**—American Merganser.

11. **Merganser serrator.**—Red-breasted Merganser.

12. **Lophodytes cucullatus.**—Hooded Merganser.

All of the above three species are in local collections taken in previous years in the county. Lately **M. serrator** has not been taken here, while the other two have become rare.

13. **Anas boschas.**—Mallard. Abundant transient in both seasons. Seen as late as June 3, 1904.

14. **Anas obscura.**—Black Duck. All specimens taken in the county belong to this form, **rubripes** not having been found. Nov. 26, 1903.

15. **Mareca americana.**—Bald-pate. Once an abundant migrant. None lately.

16. **Nettion carolinensis.**—Green-winged Teal. Rare transient. There are specimens in local collections.

17. **Querquedula discors.**—Blue-winged Teal. Tolerably common

transient. November, 1902, Bloomville; August 31, 1904, young taken.

18. **Spatula clypeata.**—Shoveller. April 26, 1906, a female observed on the Sandusky river. This is my only record.

19. **Dafila acuta**—Pin-tail. Our most common transient duck.

20. **Aix sponsa.**—Wood Duck. Rather uncommon summer resident. Nest near Old Fort in May, 1905. Four males were shot on October 18, 1904, by a local hunter.

21. **Aythya americana.**—Red-head.

22. **Aythya vallisneria.**—Canvas-back.

While these two ducks have been taken in former years, there is no recent record. They were never abundant transients.

23. **Aythya affinis.**—Lesser Scaup Duck. Fairly common transient.

24. **Aythya collaris.**—Ring-necked Duck.—Not common transient.

25. **Clangula clangula americana.**—American Golden-eye. Rare transient. November 7, 1904.

26. **Charitonetta albeola.**—Buffle-head. Not common transient. There are specimens in local collections.

27. **Harelda hyemalis.**—Old-squaw. A male taken in December, 1901, is in a local collection.

28. **Erismatura jamaicensis.**—Ruddy Duck. Not common transient.

29. **Chen cærulescens.**—Blue Goose. A male shot March 24, 1905, is now in the writer's collection. See Wilson Bulletin, June, 1905, p. 63.

30. **Branta canadensis.**—Canada Goose. Common spring and fall transient. Occasionally a winter resident, as in the winter of 1905-6.

31. **Branta canadensis hutchinsii.**—Hutchin's Goose. A male shot March 24, 1905, is now in the writer's collection. Compare Wilson Buleltin, June, 1905, p. 64.

32. **Botaurus lentiginosus.**—American Bittern. Not uncommon transient.

33. **Ardetta exilis.**—Least Bittern. Not uncommon transient; occasional summer resident.

34. **Ardea herodias.**—Great Blue Heron. Tolerably common summer resident.

35. **Butorides virescens.**—Green Heron. Fairly common summer resident. Nest with four eggs, May 10, 1904; with four young, June 3, 1904.

36. **Rallus elegans.**—King Rail. Rare transient. There are specimens in local collections.

37. **Rallus virginianus.**—Virginia Rail. Common transient, as early as April 20, 1906.

38. **Porzana carolina.**—Sora. Common transient. Noticed as late as June 11, 1904, which may indicate that it breeds.

39. **Gallinula galeata.**—Florida Gallinule. Rare transient. There are specimens in local collections.

40. **Fulica americana.**—American Coot. Common migrant, April and October.

41. **Philohela minor.**—American Woodcock. Still a fairly common summer resident, this county being especially adapted to the needs of the bird.

42. **Gallinago delicata.**—Wilson's Snipe. Not nearly as common as the Woodcock. April 21, 1906, is an average migration date.

43. **Tringa canutus.**—Knot. The only record is the one given in the Auk, Vol. XXI, No. 2, page 277, a specimen shot in the spring of 1894, on the banks of the Sandusky river.

44. **Actodromas maculata.**—Pectoral Sandpiper. A fairly common transient. May 10, 1904; May 15, 1906; August 31, 1904.

45. **Actodromas bairdii.**—Baird's Sandpiper. A not common transient. May 10 and August 31, 1904.

48. **Pelidna alpina sakhalina.**—Red-backed Sandpiper. Not a common transient. May 10, 1904. A young female which had been injured by flying against a telephone wire, October 10, 1902, is now in the writer's collection.

47. **Ereunetes pusillus.**—Semipalmated Sandpiper. May 28, 1904, I observed four specimens at close range in the muck of a deserted reservoir along the C. C. C. & St. L. tracks.

48. **Totanus melanoleucus.**—Greater Yellow-legs. A fairly common transient. May 10 and August 31, 1904.

49. **Totanus flavipes.**—Yellow-legs. A common transient. May 10 and August 31, 1904; May 15, 1906.

50. **Helodromas solitarius.**—Solitary Sandpiper. A common transient. May 10 and August 31, 1904; May 15, 1906.

51. **Bartramia longicauda.**—Bartramian Sandpiper. A common transient. May 10, 1904. No breeding records so far.

52. **Actitis macularia.**—Spotted Sandpiper. Common summer resident. Arrivals: April 20, 1903; April 29, 1904; April 21, 1906. Departures: September 18, 1903; August 31, 1904.

53. **Charadrius dominicus.**—American Golden Plover. There is a specimen in the Heidelberg museum collected in the spring of 1894, on the banks of the Sandusky river. This is the only record.

54. **Oxyechus vociferus.**—Killdeer. Common summer resident. Arrival as early as February 7, 1906; departure as late as November 26, 1903. Nest with four eggs June 10, 1905.

55. **Colinus virginianus.**—Bob-white. Fairly common resident, but not nearly as common as in southern Ohio. Nest with 15 eggs (fresh) July 22, 1903; with 17 eggs (fresh) August 7, 1904.

56. **Bonasa umbellus.**—Ruffed Grouse. The last specimen of this species was shot by a young man of my congregation three miles north of Tiffin, in the fall of 1892. Since then it seems to be extinct.

57. **Meleagris gallopavo silvestris.**—Wild Turkey. Extinct. The last record given is 1880.

58. **Ectopistes migratorius.**—Passenger Pigeon. Extinct. No records since the '60s. There were several large roosting places in the county.

59. **Zenaidura macroura.**—Mourning Dove. Common in summer, less so in winter, but I have found it in some numbers every winter.

60. **Cathartes aura.**—Turkey Vulture. Fairly common summer resident. Arrives the first week in April and remains until late October.

61. **Circus hudsonius.**—Marsh Hawk. A not common migrant and winter resident. Not seen later than March 19, 1903.

62. **Accipiter velox.**—Sharp-shinned Hawk. Rather rare resident.

63. **Accipiter cooperii.**—Cooper's Hawk. Rather rare resident.

64. **Buteo borealis.**—Red-tailed Hawk. Common resident. Nests with eggs April 5, 1905.

65. **Buteo lineatus.**—Red-shouldered Hawk. Common in summer, less so in winter. Nest with four fresh eggs, April 21, 1906.

66. **Buteo platypterus.**—Broad-winged Hawk. November 30, 1903; March 10, 1904. Apparently not always present in summer.

67. **Aquila chrysætos.**—Golden Eagle. No records since 1884, but there are several specimens in local collections.

68. **Haliæetus leucocephalus.**—Bald Eagle. An adult shot at Bloomville is now in the Heidelberg University museum. There are several young ones in other collections.

69. **Falco columbarius.**—Pigeon Hawk. Rare migrant, but solitary individuals are seen in summer, notably July 10 and 13, 1904.

70. **Falco sparverius.**—American Sparrow Hawk. Common resident. Nest with five fresh eggs May 28, 1904 (this was the second set).

71. **Pandion haliætus carolinensis.**—American Osprey. Not common migrant, but seen every spring in April along the Sandusky river.

72. **Strix pratincola.**—American Barn Owl. Four records. Compare Auk, Vol. XX, No. 1, January, 1903, p. 67, and Wilson Bulletin No. 53, December, 1905, p. 132.

73. **Asio wilsonianus.**—American Long-eared Owl. One shot two miles north of Tiffin, September 15, 1902. Apparently a rather rare resident.

74. **Asio accipitrinus.**—Short-eared Owl. Not common spring and fall migrant. There are several in local collections.

75. **Syrnium varium.**—Barred Owl. A rather rare resident.

76. **Megascops asio.**—Screech Owl. Common resident. Nest with five fresh eggs April 2, 1905. Four young June 23, 1903.

77. **Bubo virginianus.**—Great Horned Owl. A tolerably common resident, even inside the corporation limits.

78. **Coccyzus americanus.**—Yellow-billed Cuckoo. Fairly common

summer resident. Arrival: May 9, 1903; May 7, 1904; May 15, 1906. Departure: September 15, 1902.

79. **Coccyzus erythrophthalmus.**—Black-billed Cuckoo. Fairly common summer resident. Arrival: May 10, 1904; May 15, 1906.

80. **Ceryle alcyon.**—Belted Kingfisher. Common in summer and a few remain all winter, even in the winter of 1903-04.

81. **Dryobates villosus.**—Hairy Woodpecker. Common resident.

82. **Dryobates pubescens medianus.**—Downy Woodpecker. Common resident. Nest with four fresh eggs May 9, 1903.

83. **Sphyrapicus varius.**—Yellow-bellied Sapsucker. Common transient. April 5, 1904; April 20, 1906.

84. **Melanerpes erythrocephalus.**—Red-headed Woodpecker. Common summer resident, arriving late in April and departing in October, rarely remaining all winter.

85. **Centurus carolinus.**—Red-bellied Woodpecker. Rare resident. One shot November 26, 1903. Seen May 10, 1904. These are the only records.

86. **Colaptes auratus luteus.**—Northern Flicker. Common resident. Nest May 6, 1905.

87. **Antrostomus carolinensis.**—Whip-poor-will. Rare summer resident. Found in some of the ravines in the northern and southern parts of the county.

88. **Chordeiles virginianus.**—Nighthawk. A common summer resident, arriving between April 20 and May 10, departing late in September or early in October.

89. **Chætura pelagica.**—Chimney Swift. Common summer resident. Arrival: April 18, 1903; May 1, 1904; April 20, 1905; April 20, 1906, at 5 p. m. Departure: September 18, 1903; September 22, 1904; September 8, 1905.

90. **Trochilus colubris.**—Ruby-throated Hummingbird. Fairly common summer resident. Arrival: May 9, 1903; May 10, 1904; May 15, 1906.

91. **Tyrannus tyrannus.**—Kingbird. Common summer resident. Arrival: May 9, 1903; May 3, 1904; April 28, 1906. Departure: September 17, 1904. Nest with three fresh eggs June 11, 1904.

92. **Myiarchus crinitus.**—Crested Flycatcher. Common summer resident. Arrival: May 9, 1903; May 7, 1904; May 11, 1906. Departure: September 17, 1904.

93. **Sayornis phœbe.**—Phœbe. Common summer resident. Arrival: March 19, 1903; April 15, 1904; April 1, 1905; April 1, 1906. Departure: September 17, 1904. Nest begun April 5. Five heavily incubated eggs May 1, young May 10. Second set June 3, three eggs.

94. **Contopus virens.**—Wood Pewee. Common summer resident. Arrival: May 9, 1903; May 10, 1904; May 6, 1905; May 11, 1906. Departure: September 15, 1902; September 18, 1903; September 17, 1904.

95. **Empidonax flaviventris.**—Yellow-bellied Flycatcher. Rare migrant. May 15, 1906, two seen. September 17, 1904, one seen.

96. **Empidonax virescens.**—Green-crested Flycatcher. Fairly common summer resident. Arrival: May 9, 1903; May 10, 1904; May 11, 1906. Last, September 17, 1904.

97. **Empidonax traillii.**—Traill's Flycatcher. Fairly common summer resident. Arrival: May 10, 1904; May 15, 1906.

98. **Empidonax minimus.**—Least Flycatcher. Tolerably common migrant. May 10, 1904; May 15, 1906.

99. **Otocorys alpestris.**—Horned Lark. A flock of seventeen seen on January 2, 1904.

100. **Otocorys alpestris praticola.**—Prairie Horned Lark. Resident. More common in winter.

101. **Otocorys alpestris hoyti.**—Hoyt's Horned Lark. Two seen March 15, 1905. They were not shy and easily recognizable.

102. **Cyanocitta cristata.**—Blue Jay. Common resident. In the spring of 1903 a pair nested in a rural delivery mail-box east of Tiffin.

103. **Corvus brachyrhynchos.**—American Crow. Resident. Several large roosts were noted in the winter of 1904-5. Nests with five fresh eggs April 5, 1905, with five incubated eggs April 21, 1906, and four incubated eggs May 15, 1906. Four young May 10, 1904.

104. **Dolichonyx oryzivorus.**—Bobolink. Common summer resident. Arrival: May 9, 1903; April 29, 1904; April 28, 1905; April 21, 1906, 5:30 p. m. Departure: September 15, 1902; September 18, 1903; September 22, 1904; September 8, 1905.

105. **Molothrus ater.**—Cowbird. Common summer resident. Arrival: March 19, 1903; April 14, 1904; April 1, 1905; April 13, 1906. From the middle of June until the end of August, 1905, there was a Cowbird roost on Jefferson street, and as I sat in front of my house every evening I could see at first the five or more advance scouts coming in and circling around for a while, until they settled. Then came troops numbering from 20 to 40, while over them at right angles, enormous flocks of Grackles would fly to their roost at the Heidelberg University campus. From the end of August on, however, they deserted their own roost and joined the Grackles on the campus. In the fall they often mingle with the Bobolinks, while in the spring they prefer the company of the Grackles and Red-wings.

106. **Agelaius phœniceus.**—Red-winged Blackbird. Common summer resident. Breeding records are too numerous to mention. Arrival: March 19, 1903; March 10, 1904; March 15, 1905; March 25, 1906.

107. **Sturnella magna.**—Meadowlark. Common summer resident. A few always stay, even during the coldest winters. Six fresh eggs June 3, 1904.

108. **Icterus spurius.**—Orchard Oriole. A rather rare summer res-

ident. Arrival: May 1, 1903; May 6, 1904; May 6, 1905; April 28, 1906.

109. **Icterus galbula.**—Baltimore Oriole. Common summer resident. Arrival: May 1, 1903; April 29, 1904; April 28, 1905; April 27, 1906.

110. **Euphagus carolinus.**—Rusty Blackbird. Common migrant. November and March until May.

111. **Quiscalus quiscula æneus.**—Bronzed Grackle. Common summer resident. Arrival: March 9, 1903; March 4, 1904; March 14, 1905; March 25, 1906. Departure: September 18, 1903; November 4, 1904; October 29, 1905. There are several large roosts in this vicinity, an especially large one on the Heidelberg University campus.

112. **Carpodacus purpureus.**—Purple Finch. Occasional winter visitor. January 6, 1904; January 5, 1905.

113. **Loxia curvirostra minor.**—American Crossbill. Specimens shot December 5 and 12, 1892, are in the Heidelberg University museum.

114. **Astragalinus tristis.**—American Goldfinch. Common resident. Nest with five eggs August 12, 1903, with six young August 8, 1905.

115. **Passerina nivalis.**—Snowflake. Rare winter visitor. A flock of 50 to 60 January 2, 1904.

116. **Pœcetes gramineus.**—Vesper Sparrow. Common summer resident. Arrival: March 19, 1903; April 1, 1904; April 1, 1905; April 1, 1906. Departure: October 13, 1904.

117. **Passerculus sandwichensis savanna.**—Savanna Sparrow. Two records: March 19, 1903; May 10, 1904. Solitary individuals.

118. **Coturniculus savannarum passerinus.**—Grasshopper Sparrow. Common summer resident. Arrival: May 9, 1903; May 5, 1904; April 28, 1906. Nest with five fresh eggs and one with four fresh eggs, June 3, 1904.

119. **Zonotrichia leucophrys.**—White-crowned Sparrow. Common transient. September 15 to 18, 1904; May 10, 1904, May 15 and April 28, 1906.

120. **Zonotrichia albicollis.**—White-throated Sparrow. Common transient, but rare winter resident. Arrival and departure with the preceding.

121. **Spizella monticola.**—Tree Sparrow. Not common winter resident, more common as a transient. It remains as late as May 10 (1904).

122. **Spizella socialis.**—Chipping Sparrow. Common summer resident. It nests about May 10 to 15. Arrival: March 19, 1903; March 27, 1904; April 1, 1905; April 3, 1906.

123. **Spizella pusilla.**—Field Sparrow. Common summer resident. Arrival: March 1, 1903; April 1, 1904; April 1, 1905; April 4, 1906.

Nests with four fresh eggs June 11, 1904 (second set). First sets: May 13, four eggs, May 15, three eggs, 1906.

124. **Junco hyemalis.**—Slate-colored Junco. Common winter resident. It arrives as early as September 22, 1904, leaving as late as May 5, 1904.

125. **Melospiza cinerea melodia.**—Song Sparrow. Common resident. First nests: May 10, 1905, four eggs, heavily incubated by May 15 and 19, 1906, five eggs. Second nests: June 23, 1903, four eggs. Nest with one young Cowbird and one fresh Cowbird's egg, but without either eggs or young of the owner, May 15, 1906.

126. **Melospiza lincolnii.**—Lincoln's Sparrow. The only records are two seen in the brush along the Sandusky river, May 15, 1906.

127. **Melospiza georgiana.**—Swamp Sparrow. Not common transient. May 9, 1903, and April 28 and May 15, 1906.

128. **Passerella iliaca.**—Fox Sparrow. Not common spring migrant. April 15, 1904. No fall records.

129. **Pipilo erythrophthalmus.**—Towhee. Common summer resident. Arrival: March 19, 1903; April 15, 1904; March 14, 1905. Departure: October 10, 1903; October 13, 1904.

130. **Cardinalis cardinalis.**—Cardinal. Common resident, but fewer numbers in winter. Nests about May 10.

131. **Zamelodia ludoviciana.**—Rose-breasted Grosbeak. Common transient. No breeding records yet. Arrival: May 8, 1903; May 10, 1904; May 15, 1906; August 1, 1903.

132. **Cyanospiza cyanea.**—Indigo Bunting. Common summer resident. Arrival: May 9, 1903; May 10, 1904; May 11, 1906. Departure: October 13, 1904. Nest with three eggs and one of Cowbird, June 11, 1904, with two eggs and two of Cowbird (fresh) June 23, 1903. With 4 young. August 11, 1905.

133. **Spiza americana.**—Dickcissel. A somewhat rare summer resident, mostly in the southern part of the county. Arrival: May 10, 1904.

134. **Piranga erythromelas.**—Scarlet Tanager. A common summer resident. Arrival: May 9, 1903; May 10, 1904; May 11, 1906. Departure: September 18, 1903.

135. **Progne subis.**—Purple Martin. A tolerably common summer resident. Arrival: April 15, 1903; April 1, 1904; April 21, 1905; April 1, 1906.

136. **Petrochelidon lunifrons.**—Cliff Swallow. A fairly common but local summer resident. May 13, 1904.

137. **Hirundo erythrogaster.**—Barn Swallow. Common summer resident. Arrival: April 3, 1903; April 15, 1904; April 20, 1906.

138. **Iridoprocne bicolor.**—Tree Swallow. Rare transient. April 21, 1906.

139. **Riparia riparia.**—Bank Swallow. Tolerably common summer rsident. Arrival: May 9, 1903; May 10, 1904; April 21, 1906.

140. **Stelgidopteryx serripennis.**—Rough-winged Swallow. Fairly common summer resident. Arrival: May 9, 1904; May 15, 1906. Breeds May 28, 1904.

141. **Ampelis cedrorum.**—Cedar Waxwing. Common resident. September 18, 1903, a nest with three young.

142. **Lanius borealis.**—Northern Shrike. Rare winter visitor. Recorded during the winter of 1903-4 many times.

143. **Lanius ludovicianus migrans.**—Migrant Shrike. Fairly common resident. May 5, 1904, a nest with four eggs. June 23, 1903, a nest with four young.

144. **Vireo olivaceus.**—Red-eyed Vireo. Common summer resident. Arrival: May 9, 1903; May 5, 1904; April 28, 1906. Departure: September 22, to October 13, 1904.

145. **Vireo philadelphicus.**—Philadelphia Vireo. Rare transient. May 9, 1903, a pair.

146. **Vireo gilvus.**—Warbling Vireo. Common summer resident. Arrival: May 9, 1903; May 5, 1904; May 11, 1906.

147. **Vireo flavifrons.**—Yellow-throated Vireo. Not common summer resident. Arrival: May 9, 1903; May 10, 1904; May 15, 1906.

148. **Vireo solitarius.**—Blue-headed Vireo. Not common transient. No breeding records. Arrival: May 10, 1904; May 15, 1906.

149. **Mniotilta varia.**—Black and White Warbler. Common transient. Rare summer resident. Arrival: May 10, 1904; May 11, 1906; September 17, 1904.

150. **Helminthophila pinus.**—Blue-winged Warbler. Common summer resident. May 9, 1903; May 5, 1904; May 11, 1906.

151. **Helminthophila chrysoptera.**—Golden-winged Warbler. Not common migrant. May 10, 1904; May 15, 1906.

152. **Helminthophila leucobronchialis.**—Brewster's Warbler. One record, September 17, 1904. See Wilson Bulletin, December, 1904, pp. 109-10.

153. **Helminthophila rubricapilla.**—Nashville Warbler. Common spring transient. May 11 and 15, 1906.

154. **Helminthophila peregrina.**—Tennessee Warbler. Common transient. May 15, 1906; September 16, 1902; September 18, 1903; September 22, 1904.

155. **Compsothlypis americana usneæ.**—Northern Parula Warbler. Common transient. May 10, 1904; May 15, 1906; September 15, 1902; September 18, 1903; September 22, 1904.

156. **Dendroica tigrina.**—Cape May Warbler. Rare transient. May 15, 1906. September 17, 1904.

157. **Dendroica æstiva.**—Yellow Warbler. Common summer resident. Arrival: April 25, 1903; May 3, 1904; April 26, 1906. Nest with five eggs and one of Cowbird May 21, 1904, with three young June 11, 1904.

158. **Dendroica cærulescens.**—Black-throated Blue Warbler. Com-

mon transient. May 10, 1904; May 15, 1906; September 15, 1902; September 18, 1903; September 22, 1904; September 8, 1905.

159. **Dendroica coronata.**—Myrtle Warbler. Common transient. May 5, 1903; May 10, 1904; April 28, 1906; September 17, 1904.

160. **Dendroica caerulea.**—Cerulean Warbler. Rare migrant and summer resident. May 10, 1904; May 15, 1906; September 17, 1904.

161. **Dendroica maculosa.**—Magnolia Warbler. Common transient. May 10, 1904; May 15, 1906; September 18, 1903; September 22, 1904; September 8, 1905.

162. **Dendroica pensylvanica.**—Chestnut-sided Warbler. Common transient. May 10, 1904; May 11 to 15, 1906.

163. **Dendroica castanea.**—Bay-breasted Warbler. Common transient. May 10, 1904; May 15, 1906; September 18, 1903; September 15, 1902.

164. **Dendroica striata.**—Black-poll Warbler. Common transient. May 9, 1903; May 10, 1904; May 15, 1906; September 15, 1902; September 18, 1903; September 17 to 22, 1904; September 8, 1905.

165. **Dendroica blackburniæ.**—Blackburnian Warbler. Common transient. May 10, 1904; May 15, 1906; September 17, 1904.

167. **Dendroica virens.**—Black-throated Green Warbler. Common transient. May 9, 1903; May 10, 1904; May 11 to 15, 1906; September 15, 1902; September 18, 1903; September 22, 1904; September 8, 1905.

167. **Dendroica kirtlandi.**—Kirtland's Warbler. Two seen May 11, 1906. They were observed walking on the ground, and gleaning in low saplings ten feet away from me. Having seen the entire series of this species in the University of Michigan collection, in September, 1905, a mistake in identification is excluded. The bird bears a certain resemblance to the Magnolia Warbler.

168. **Dendroica vigorsii.**—Pine Warbler. Rare transient. May 10, 1904; May 15, 1906.

169. **Dendroica palmarum.**—Palm Warbler. Rare migrant. May 10, 1904; May 15, 1906.

70. **Dendroica discolor.**—Prairie Warbler. Rare. Four seen on May 11, 1906. See another page of this issue.

171. **Seiurus aurocapillus.**—Oven-bird. Common summer resident. Arrival: May 10, 1904; May 11, 1906. Departure: September 18, 1903; September 22, 1904.

172. **Seiurus noveboracensis.**—Water-Thrush. Rather rare migrant. September 17, 1904. May 15, 1906.

173. **Seiurus motacilla.**—Louisiana Water-Thrush. Common transient, but rare summer resident. May 10, 1904. September 18, 1903.

174. **Geothlypis philadelphia.**—Mourning Warbler. Fairly common migrant. May 10, 1904; May 15, 1906.

175. **Geothlypis trichas brachydactyla.**—Northern Yellow-throat. Common summer resident. Arrival: May 9, 1903; May 10, 1904; May 11, 1906. Departure: September 17, 1904.

176. **Icteria virens.**—Yellow-breasted Chat. Common summer resident, but local in distribution. Arrival: May 9, 1903; May 10, 1904; May 11, 1906.

177. **Wilsonia pusilla.**—Wilson's Warbler. Rather rare transient. May 10, 1904; May 15, 1906.

178. **Wilsonia canadensis.**—Canadian Warbler. Common spring transient. May 10, 1904. Abundant May 15, 1906.

179. **Setophaga ruticilla.**—American Redstart. Common summer resident. Arrival: May 9, 1903; May 5, 1904; April 28, 1906. Departure: September 17, 1904.

180. **Anthus pensilvanicus.**—American Pipit. Not common transient. May 5, 1904. September 17, 1904; October 13, 1905.

181. **Galeoscoptes carolinensis.**—Catbird. Common summer resident. Arrival: April 20, 1903; April 29, 1904; April 28, 1906. Departure: September 22, 1904.

182. **Toxostoma rufum.**—Brown Thrasher. Common summer resident. Arrival: March 19, 1903; April 14, 1904; April 5, 1905; April 20, 1906. Departure: September 15, 1902; September 18, 1903; September 22, 1904; September 22, 1905. Nesting May 13, 1904.

183. **Thryothorus ludovicianus.**—Carolina Wren. Rare. April 18, 1903; May 5, 1904.

184. **Troglodytes aëdon.**—House Wren. Common summer resident. Arrival: April 18, 1903; May 2, 1904; April 27, 1906. Nesting June 3, 1904.

185. **Olbiorchilus hiemalis.**—Winter Wren. Not common winter resident until March 19, 1903.

186. **Cistothorus stellaris.**—Short-billed Marsh Wren. Rare migrant. Seen May 21, 1904, when it was well observed for ten minutes in long, coarse grass in a low swampy place.

187. **Telmatodytes palustris.**—Long-billed Marsh Wren. Only a pair or so known to breed in the remnants of the Bloomville marshes. Otherwise a rare migrant.

188. **Certhia familiaris americana.**—Brown Creeper. Fairly common in winter. November 7, 1904. April 29, 1904.

189. **Sitta carolinensis.**—White-breasted Nuthatch. Common resident.

190. **Sitta canadensis.**—Red-breasted Nuthatch. Common transient. May 21, 1904; June 10, 1905; May 15, 1906.

191. **Bæolophus bicolor.**—Tufted Titmouse. Common resident, but less common in winter.

192. **Parus atricapillus.**—Chickadee. Common resident. Nest with seven young May 19, 1906.

193. **Regulus satrapa.**—Golden-crowned Kinglet. Common migrant. October 6, 1902. May 15, 1906.

194. **Regulus calendula.**—Ruby-crowned Kinglet. Rather rare migrant. May 10, 1904, is the latest spring date.

195. **Polioptila cærulea.**—Blue-gray Gnatcatcher. Common migrant, but not common summer resident. April 18, 1903; April 15, 1904; April 20, 1906.

196. **Hylocichla mustelina.**—Wood Thrush. Common summer resident. Arrival: May 9, 1903; May 5, 1904; April 28, 1906. Departure: September 17, 1904. Nest with two eggs May 28, 1904.

197. **Hylocichla fuscescens.**—Wilson's Thrush. Common migrant. Arrival: May 9, 1903; May 10, 1904; May 11, 1906. September 17, 1904.

198. **Hylocichla aliciæ.**—Gray-cheeked Thrush. Not common migrant. May 11, 1906. September 17, 1904.

199. **Hylocichla swainsonii.**—Olive-backed Thrush. Common migrant. May 10, 1904; May 15, 1906. September 22, 1904.

200. **Hylocichla guttata pallasii.**—Hermit Thrush. Common migrant. April 18, 1903; April 15, 1904; April 20, 1906. October 13, 1904.

201. **Merula migratoria.**—American Robin. Common summer resident. It arrives early in March and departed November 7, 1904. A few remained all winter 1905-6. An albino was noted June 11, 1904. There was a roost in the trees of Jefferson street, Tiffin, in the fall of 1904, from 120 to 180 Robins resorted to the roost.

202. **Sialia sialis.**—Bluebird. Common summer resident. Arriving March 1, departing in November. A few remained all winter 1905-6.

203. **Helmintophila celata.**—Orange-crowned Warbler. May 10, 1904. Observed singing. Rare transient.

Introduced Species.

204. **Passer domesticus.**—English Sparrow. Abundant. Several albinos noted.

205. **Phasianus torquatus.**—Ring-necked Pheasant. Not common, but breeding. Nest found in 1901.

REMARKS ON THE SUMMER BIRDS OF LAKE MUSKOKA, ONTARIO.

BY B. H. SWALES AND P. A. TAVERNER.

During the summer of 1904 we were able to spend a short time on Gibralter Island, situated in Lake Muskoka, Muskoka District, Ontario. This is one of the largest of the many lakes of various sizes that fill the glacial furrows in the heart of the Laurentian formation back of Georgian Bay. The country is

noted for its rocky wildness and, although the shores are here and there occupied by the summer cottages of the tourists, their influence scarcely extends back from the lake farther than the eye can reach. The country has been lumbered over and all marketable timber extracted, but if it were not for the rotting pine stumps one sees on every hand the observer, when out of sight of the sparkling waters of the lake, might imagine himself buried in the primeval forest unprofaned by the intruding foot of civilized man. The country has, it is true, suffered the concomitant evils that follow the lumbermen, as the great expanses of burnt ridges manifest, with their gaunt gray skeleton pine standing like the monuments of a vanished age scarred black with fire and bleached with storms to every shade of soft and solemn grey. Scattered clearings exist here and there hemmed around with forest except where they manage to break through the leafy barrier to the lake or run up to the barred ridges from which the life of the soil has been burnt by repeated forest fires.

The Beaumaris side of the lake is settled to a greater extent than the opposite side, and the stage road from Beaumaris to Bracebridge runs through clearings of an older and more settled type. The Bala side, towards which Gibralter Island lies, exhibits all the characteristics of a new country whose agricultural future is almost hopeless. Hay and fodder for a few cattle and sheep and a little green stuff for home and tourist consumption is about all that is raised, and the harvesting among the stumps and rocks has to be done with the almost vanished scythe, while oxen and jumpers largely take the place of horse and farm wagon.

The principal forest growth is pine, both Norway and white, with considerable masses of hemlock scattered about and cedar thickets in the lower parts. Deciduous trees are, however, plentiful and "beech flats" are common enough, while the rest of the land is filled with forest growths of oak, maple, basswood, American hornbeam, and other hardy timber. The second growth is generally poplar mixed with white birch which usually succeeds the former short-lived growth and is in its turn replaced by maple and oak. In the latter stage in ex-

posed places a few struggling pines, pushing their way up and between their neighbors, give a forecast of what final type would triumph in the end if nature had full sway when the cycle is completed.

The shores are naturally wooded to the water's edge, and are generally rocky; marshes or swamp, except of the sphagnum order, about some little land-locked lake are very rare and in consequence the water birds that the innumerable little lakes would otherwise attract are almost entirely absent. The main body of the water fowl pass over this, what would otherwise be to them an attractive land, as quickly as possible and, if they stop at all, make as short a visit as is compatible with their needs.

One of the most interesting features of the avi-fauna of this country is the difference between the settled and the unsettled portions. The birds of the open are gradually increasing in the most extensive clearings around Bracebridge, but are never seen in the little slashings made by the homesteader on the other side of the lake. In the forest itself during the summer months bird life, to the observer, seems almost entirely absent, although in spring the woods are alive with migrants and the glorious summer evenings are filled with the melody of the Hermit and Wilson's Thrushes, with the silver whistle of the White-throated Sparrow rising above it all. During the period of our stay, however, all this was passed—the sweet songsters had left before the hosts of the fall migrants had arrived. We tramped often all day over a varied route that afforded a variety of country and for hours saw scarcely a single bird or heard a note in spite of the closest attention. Generally, however, early in the morning and before sunset we could find little bunches of warblers around a certain shore of the island, but it required quick work to observe or collect them as they were gone in but a few minutes, not to be found again.

The fact that struck us with most force during this time was the apparent absence of any strong migratory movement. There were migrants present, but their numbers were as nothing, considering the time of the year. When we left Detroit the great rush of migration had already started, and small and

large groups of migrating birds were to be met with at almost any point. We naturally expected to find analogous conditions up here, but in this were disappointed. During this same time at Guelph, about one hundred and twenty miles to the south, the migrations were in full swing and the northern forms were coming in almost daily. Many of the common summer residents had left Muskoka before we arrived. These were not in all cases species that hurry through the southern stations early in the season, but the late comers and long stayers, as White-throated Sparrows, Magnolia and Myrtle Warblers, and others. These birds all breed in Muskoka, the first very commonly, but of it we only saw *one* and of the others only one or two. Nor were other species from farther north much more common and it looked as if the resident birds had left before the more northern breeders had started to migrate. It may be held, of course, that in this vast extent of wooded territory, the migrants were so widely scattered as to be more easily overlooked than seen, but this hardly satisfies the conditions as we found them. The amount of hard work we put in and the ground we covered would *in this case* have yielded more individuals if this were the whole explanation. Be the reason what it may, the fact remains, that up here, just when we should expect the first great rush of the migrations, we found the forest and fields ornithologically almost dead and more resembling the quietness of the mid-breeding season than the first flush of the migrating one.

From August 24 until September 4 we were able to record a total of 59 species; a number of these were represented but by one or two specimens and few were common in the ordinary acceptation of the term. These peculiar conditions are interesting and suggestive and may give this report of the trip a little more value than it might otherwise have as a mere catalogue of birds seen.

Gibralter Island is about one half mile long and in places not more than half that distance in width. It is directly across the lake from Beaumaris. The rocks rise abruptly from the lake shore and form an extensive ridge heavily wooded, in the center, which culminates at the north end in a high promon-

tory from which one may view the beautiful lake country, dotted with its numerous wooded islands, for many miles.

Gavia imber.—Loon. One seen on September 2 flying down the lake in a driving rain storm. This species is decreasing in numbers each year at Muskoka. Formerly Taverner heard them on nearly every summer night from the island and they bred here and there throughout the region.

Larus argentatus.—Herring Gull. Fairly common. A few individuals were seen every day following the wake of the little lake steamers that pass up and down each day. The birds hang around Muskoka wharf and Gravenhurst Bay until the steamers go out, when the gulls follow after. They undoubtedly breed in Georgian Bay about thirty miles west.

Duck.—Species? A small flock of six birds passed down the lake on Sept. 2. We saw no others as there are no suitable feeding grounds to attract the birds.

Botaurus lentiginosus.—American Bittern. One bird flushed from a small marsh on Tondern Island on August 29. There was scarcely room here for the bird to turn around in. This is rather a rare species here, a pair or two breeds in Bear Bay, near Gravenhurst, and Taverner has seen it on Black's Creek on the west side of the lake.

Bonasa umbellus togata.—Canadian Ruffed Grouse. Fairly abundant. The extreme tameness of these birds was astonishing to us in contrast with the Michigan birds. One could approach at will within almost striking distance of the parents and brood and even then they would generally simply run out of the path without any attempt at flight. Of course when the shooting season is on this all changes.

Buteo platypterus.—Broad-winged Hawk. But two seen, one on the mainland August 29, the other lived on Gibralter and was observed every day. This is, however, the most abundant hawk here.

Falco sparverius.—Am. Sparrow Hawk. One seen August 29 flying over the clearing on Tondern Island. It is only on the eastern side of the lake where the most extensive clearings are that this species is to be seen here. Perhaps the lack of grasshoppers explains its absence elsewhere.

Falco peregrinus anatum.—Duck Hawk. During our present stay we failed to observe this species. It has, however, bred for many years on Crown Island just north of Gibralter and the nest has seldom been disturbed. Notwithstanding this fact the number of birds in this region seems to be restricted to a single pair. Taverner took a set of four eggs from this nest on May 23, 1898, and it is upon this one record that the various Ontario records in Macoun's Catalogue of Canadian Birds are based. On August 30th we visited this nest, which is situated on the side of a cliff on the highest portion of Crown

Island about 75 feet above the lake. The nest contained many bones of the Ruffed Grouse, Flicker, Blue Jay, and Pileated Woodpecker.

Antrostomus vociferus.—Whip-poor-will. One bird heard calling on the evening of August 26, two birds on August 27 from the mainland directly across from our cabin. None were heard after this date and we naturally supposed that they had left.

Ceryle alcyon.—Belted Kingfisher. One pair observed each day during our stay in the vicinity of the island. Where this species nests is unknown as the nearest place known to Taverner is around Bracebridge river which has in some places banks of considerable heights. In our vicinity on the lake rarely more than a single pair is seen and these are generally roaming about.

Dryobates villosus.—Hairy Woodpecker.—But one bird seen—on August 28. This is, however, a common resident species. There is some doubt as to the occurrence of **leucomelas** here. All specimens so far taken have been **villosus**...

Dryobates pubescens medianus.—Downy Woodpecker. A common species in all sections visited.

Sphyrapicus varius.—Yellow-bellied Sapsucker. Not uncommon in the higher portions of the island and on the mainland. Is much less abundant on the islands. Breeds.

Colaptes auratus luteus.—Northern Flicker. Fairly abundant on the adjacent mainland, rarer on the islands.

Chordeiles virginianus.—Nighthawk. One noted August 31, apparently one of the last birds of the season. A common summer resident.

Chætura pelagica.—Chimney Swift. A number were seen hawking over the lake every evening during our stay and were still present when we left September 4th. As there cannot be in this region enough chimneys to afford all the birds a nesting place the main body must use hollow trees. Every flue is, however, occupied.

Trochilus colubris.—Ruby-throated Hummingbird. One male seen August 31. This species is quite common here in the clearings, especially if there are any flowers about. Otherwise the bird would appear quite rare.

Myiarchus crinitus.—Crested Flycatcher. We observed but one bird, on August 29. The species is, however, quite common here, especially on Gibralter.

Sayornis phœbe.—Phœbe. An abundant bird on the island and in the various clearings around Beaumaris. One pair has nested for many years on the porch of the Taverner cottage and also against the smooth sides of the boat-house.

Nuttalornis borealis.—Olive-sided Flycatcher. In the wooded sections of the mainland we observed what we were certain were this species, but as we did not take any specimens did not prove the matter. The birds in question were generally confined to the dense

woods, where they were perched at the top of some tall dead pine. This species is, however, an abundant bird in this region.

Horizopus virens.—Wood Pewee. This was one of the most abundant species on the islands and mainland until September 1, after this date we failed to either see or hear it.

Empidonax minimus.—Least Flycatcher. Not uncommon, noted about every day on the island and mainland.

Cyanocitta cristata.—Blue Jay. We were able to find but *one* bird, which was rather surprising, as this is usually an abundant bird here. The only explanation we can offer is that the resident birds had left and the northern birds had not yet come down.

Corvus brachyrhynchos.—American Crow. Abundant.

Agelaius phœniceus.—Red-winged Blackbird. But one male seen, generally common in certain localities as Bear Bay, or back of Tondern Island. Unless one happens to meet with a flock in these suitable localities the species appears to be quite rare.

Quiscalus quiscula æneus.—Bronzed Grackle. One seen August 26, another at Gravenhurst walking on the logs in the bay, on September 4. They are generally common here and on parts of Tondern Island.

Carpodacus purpureus.—Purple Finch. Three birds were met with near the head of Gibralter Island on August 27, another on September 3.

Astragalinus tristis.—American Goldfinch. A common species in the cleared portions of Tondern Island and on the mainland back of Beaumaris.

Pœcetes gramineus.—Vesper Sparrow. We found this well distributed in the fields running back from Beaumaris on August 29. Three more were noted on August 31.

Zonotrichia albicollis.—White-throated Sparrow. We saw but one bird—on the day of our arrival. This is another case of the migrants leaving before the northern birds come in. This is a regular common breeder on Gibralter. Mr. A. B. Klugh at Guelph reported many migrants there some time before we left Muskoka.

Spizella socialis.—Chipping Sparrow. Rather common on Tondern Island, near Beaumaris. A few were around our cabin on Gibralter.

Junco hyemalis.—Slate-colored Junco. Abundant all over the island and the country bordering the lake shore—much rarer inland.

Melospiza cinerea melodia.—Song Sparrow. Rare except in the immediate vicinity of the clearings on Tondern Island and on the mainland. Is generally common directly across from the island on the edges of Broadlay's farm.

Hirundo erythrogaster.—Barn Swallow. Observed in some numbers on August 28 and 29 near cleared land. Formerly nested in Broadley's barn on the adjacent mainland.

Iridoprocne bicolor.—Tree Swallow. In the little marsh back of the hotel at Beaumaris we saw one flying over the water on August 29.

Ampelis cedorum.—Cedar Waxwing. An abundant species everywhere—we found it present on all the islands visited, on the mainland, etc.

Vireo olivaceus.—Red-eyed Vireo. A common species on the island. Several nests we examined of the past summer's construction were beautiful little affairs constructed on the outside mainly of white birch bark.

Mniotilta varia.—Black and White Warbler. Fairly common in all parts of Gibralter Island.

Compsothlypis americana usneæ.—Northern Parula Warbler. Fairly common, on August 28 and 29 we saw two on each day and one on August 31 and September 1.

Dendroica cærulescens.—Black-throated Blue Warbler. A pair or so seen throughout our stay on the island, several seen August 29 on the mainland.

Dendroica coronata.—Myrtle Warbler. Only one bird noted, a female, taken in the pines directly back of our cabin.

Dendroica maculosa.—Magnolia Warbler. But three birds found—two on August 29, and one on September 4. This is a common migrant here and we think that a few pairs remain and breed.

Dendroica blackburniæ.—Blackburnian Warbler. Fairly common, three seen August 29, a few individuals at different times during our stay. This is a fairly common breeder here. Taverner shot quite a large, young Cowbird being fed by one of these warblers in September, 1896.

Dendroica striata.—Black-poll Warbler. One taken September 1. No others recorded.

Dendroica virens.—Black-throated Green Warbler. This was by far the most abundant warbler present until September 2d, after this date we failed to find it. A common breeder here.

Dendroica vigorsii.—Pine Warbler. Rather common until September 1st, we did not find it later.

Seiurus aurocapillus.—Oven-bird. While working through a low part of the island on August 29th we flushed one bird. Is a common summer resident.

Geothlypis trichas brachidactyla.—Northern Yellow-throat. We secured a male in the small marsh back of Beaumaris on August 29. This is not a common species here.

Wilsonia canadensis.—Canadian Warbler. Not uncommon. Noted at various times during our stay.

Setophaga ruticilla.—American Redstart. Fairly common, observed every day.

Troglodytes ædon.—House Wren. We found this common on the

outskirts of Beaumaris on August 29. It was confined to the brush heaps and the snake fences.

Olbiorchilus hiemalis.—Winter Wren. But two birds seen—one on September 1, another on the 4th. This is a fairly common summer resident on the island and breeds in the dense brush.

Certhia familaris americana.—Brown Creeper. Very common everywhere.

Sitta caroliensis.—White-breasted Nuthatch. Common.

Sitta canadensis.—Red-breasted Nuthatch. On September 1 we saw one in a small birch near the cabin which was secured. No others were noted.

Parus atricapillus.—Chickadee. An abundant species everywhere.

Hylocichla fuscescens.—Wilson's Thrush. Two birds seen, on August 27 and 30. This is a common summer bird on the island.

Hylocichla guttata pallasii.—Hermit Thrush. On September 3rd we secured one bird in the center of the island. A common breeder here.

Merula migratoria.—American Robin. On the island this was far from common but we found it much more numerous on the mainland near Beaumaris.

Sialia sialis.—Bluebird. On August 29, on quite an extended trip on the mainland back of Beaumaris, we found this present in some numbers in all cleared land. Five were seen August 31.

Detroit, Mich.

TWO ALL-DAY RECORDS IN NORTHERN OHIO.

BY LYNDS JONES.

There are migrations and migrations of the birds in May, and the migrations which appeal most to the most ardent among us are those which certain conditions of weather make conspicuous by reason of the great abundance of bird life on one or more days. As far as northern Ohio is concerned the experiences of more than ten years in the study of the migrations make it possible to formulate certain laws which govern the movements of the birds northward across that region. These laws are not new, nor are they laws which have not been announced already, but they are of sufficient importance to bear repetition.

Considered purely from the standpoint of migration, warm weather accompanied by clear or fair skies during the night

incite the birds to movement northward. Cloudy nights—with the sky obscured—are unfavorable for bird movements even if the weather be warm. Cold nights, even if the sky be clear, do not induce much movement. Some birds migrate on cold clear nights. For a large movement of the birds, assuming that the time of year has arrived for such movement, at any given place which will be manifest on the next day, two conditions seem to be necessary. First, the temperature must be relatively high and the sky clear or nearly so for many leagues south of the given place; and second, to the north of the place the sky must be overcast, or the temperature low, in that place or immediately north of it.

During the present season the weather conditions during the last week in April and the first week in May were favorable for the northward movement of the smaller and later migrating birds over most of the Mississippi Valley, and eastward, at least as far as Lake Erie and southern Michigan. Most of the second week in May was cold, with northerly winds prevailing. Many birds had arrived during the favorable weather, but remained in northern Ohio and adjacent regions because of the storm and cold of the second week in May. Then followed favorable weather south, but cloudiness over Lake Erie nights up to May 16. The birds moved up to the cloud barrier and remained there. On the 14th and 15th the country teemed with all sorts of birds except the divers and ducks which had gone north earlier. Not only were species unusually numerous, as the appended lists will prove, but individuals were enormously numerous.

These two lists—Rev. W. F. Henninger, for Tiffin, Ohio, May 15th; and the writer, for Oberlin, May 14th—are given together, and the appended list of birds which were not seen but were clearly present, for the purpose of indicating the status of bird life during these two days as far as could be determined. It will be noticed that the 129 species found at Oberlin on the 14th establishes a new record for that place. However, the conditions which so profoundly influence so large a proportion of the whole bird life of a region and not the size

of the list, are the important things. These "All day" studies merely furnish the data.

The two lists which are appended may be considered fairly representative of the north-western parts of the State of Ohio during May 14th and 15th. It may be argued that because the lists were not made on the same day they are not therefore comparable. To that I would reply that the weather was such that the bird population must have been practically the same on the two days. The region about Tiffin is further removed from Lake Erie than Oberlin, and nowhere approaches near enough to it to be influenced by it, and that fact will explain the lack of the distinctively water birds, but otherwise the two regions are alike. The Oberlin region, therefore, supplies the lake shore conditions which complete the northern Ohio conditions affecting bird movements.

At Oberlin, on the 14th of May, the day opened rainy, with nearly continuous showers until nearly mid-day, with clearing skies in the afternoon. At 2:30 a. m. the temperature stood at 58, but a northerly breeze, shifting to north-easterly, and increasing to brisk, cooled the air to 48 during nearly the entire day. The early part of the day was spent in the woods, fields, and orchards south of Oberlin, the afternoon in work along the lake shore and the woods, fields and swamps bordering the lake. Thirteen out of a possible sixteen hours were spent a-field.

At Tiffin, on May 15th, the day began partly cloudy, but clearing, with a temperature of 50, ranging to 80 by mid-afternoon, with almost no wind. The work covered the region about Tiffin, including every sort of topography. The work began at 3:30 a. m., and closed at 8:30 p. m., with about two hours lost during the day at times when there was little probability of loss in records.

The participants in this work were Rev. W. F. Henninger, Tiffin, and Lynds Jones, Oberlin. It is to be regretted that other regions in the northern parts of the state are not also represented.

Species recorded at both places—Tiffin and Oberlin.

Green Heron,	**Scarlet Tanager.**
Yellow-legs.	**Barn Swallow.**

Solitary Sandpiper.
Spotted Sandpiper.
Killdeer.
Bob-white.
Mourning Dove.
Red-tailed Hawk.
Sparrow Hawk.
Yellow-billed Cuckoo.
Black-billed Cuckoo.
Belted Kingfisher.
Hairy Woodpecker.
Downy Woodpecker.
Red-headed Woodpecker.
Northern Flicker.
Chimney Swift.
Ruby-throated Hummingbird.
Kingbird.
Crested Flycatcher.
Phoebe.
Wood Pewee.
Green-crested Flycatcher.
Traill's Flycatcher.
Least Flycatcher.
Blue Jay.
American Crow.
Bobolink.
Cowbird.
Red-winged Blackbird.
Meadowlark.
Orchard Oriole.
Baltimore Oriole.
Bronzed Grackle.
American Goldfinch.
Vesper Sparrow.
White-crowned Sparrow.
White-throated Sparrow.
Chipping Sparrow.
Field Sparrow.
Song Sparrow.
Lincoln's Sparrow.
Swamp Sparrow
Towhee.
Cardinal.
Rose-breasted Grosbeak.
Indigo Bunting.
Grasshopper Sparrow.
Rough-winged Swallow.
Bank Swallow.
Cedar Waxwing.
Migrant Shrike.
Red-eyed Vireo.
Warbling Vireo.
Yellow-throated Vireo.
Black and White Warbler.
Blue-winged Warbler.
Golden-winged Warbler.
Nashville Warbler.
Tennessee Warbler.
Northern Parula Warbler.
Cape May Warbler.
Yellow Warbler.
Black-throated Blue Warbler.
Myrtle Warbler.
Magnolia Warbler.
Cerulean Warbler.
Chestnut-sided Warbler.
Bay-breasted Warbler.
Black-poll Warbler.
Blackburnian Warbler.
Black-throated Green Warbler.
Palm Warbler.
Oven-bird.
Water-Thrush.
Northern Yellow-throat.
Yellow-breasted Chat.
Wilson's Warbler.
Canadian Warbler.
American Redstart.
Catbird.
Brown Thrasher.
House Wren.
White-breasted Nuthatch.
Tufted Titmouse.
Chickadee.
Blue-gray Gnatcatcher.
Wood Thrush.
Wilson's Thrush.
Olive-backed Thrush.
Hermit Thrush.
American Robin.
Bluebird.

Birds recorded at Tiffin by W. F. Henninger not recorded at Oberlin.

Sharp-shinned Hawk.
Yellow-bellied Flycatcher.
Purple Martin.
Blue-headed Vireo.
Pectoral Sandpiper.
Mourning Warbler.
Pine Warbler.
Red-breasted Nuthatch.
Golden-crowned Kinglet.

Birds recorded at Oberlin by Lynds Jones not recorded at Tiffin.

Herring Gull.
Common Tern.
American Bittern.
Great Horned Owl.
Yellow-bellied Sapsucker.
Whip-poor-will.

King Rail.
Virginia Rail.
Sora.
Florida Gallinule.
American Woodcock.
Least Sandpiper.
Greater Yellow-legs.
Bartramian Sandpiper.
Semipalmated Plover.
Marsh Hawk.
Red-shouldered Hawk.
Bald Eagle.
Barred Owl.
Screech Owl.
Prairie Horned Lark.
Rusty Blackbird.
Savanna Sparrow.
Cliff Swallow.
Tree Swallow.
Orange-crowned Warbler.
Prairie Warbler.
Louisiana Water-Thrush.
American Pipit.
Winter Wren.
Short-billed Marsh Wren.
Long-billed Marsh Wren.
Ruby-crowned Kinglet.
Gray-cheeked Thrush.

Species not recorded which were certainly in northern Ohio on the days when these records were made.

Black Tern.
Least Bittern.
Ruffed Grouse.
Cooper's Hawk.
American Long-eared Owl.
Nighthawk.
Carolina Wren.
Lesser Scaup Duck.
Great Blue Heron.
Turkey Vulture.
Broad-winged Hawk.
Red-bellied Woodpecker.
Lark Sparrow.

It thus appears that there were not less than 150 species of birds in northern Ohio during the period covered by May 14 and 15. Of these 138 were actually recorded.

A NEW RECORD FOR THE PRAIRIE WARBLER IN OHIO.

BY W. F. HENNINGER.

On May 11th. at about 3 p. m., I ran across four individuals of the Prairie Warbler (Dendroica discolor) in our favorite Warbler woods here, one and one-half miles south-east of Tiffin. Some of the tall timber in these woods was cut a year ago and on some saplings, with Myrtle Warblers all around me, I spied these rarities, and was favored by all four with their song, so frequently heard last year in Virginia and southern Ohio. Evidently they were migrants, as on May 15th, on our "All day with the birds," when I wanted to show Mr. Karl Heilmann these birds, none were to be found, in spite of the most diligent and painstaking search. This is a new record for the Prairie Warbler in the state, and especially interesting, as none seem to have been reported from this corner of our commonwealth.

THE WILSON BULLETIN.

A Quarterly Magazine Devoted to the Study of Living Birds.
Official Organ of the Wilson Ornithological Club.

Edited by LYNDS JONES.

PUBLISHED BY THE CLUB, AT OBERLIN, OHIO.

Price in the United States, Canada and Mexico, 50 cents a year, 15 cents a number, postpaid. Price in all countries in the International Postal Union, 65 cents a year, 20 cents a number. Subscriptions may be sent to Lynds Jones, Oberlin, Ohio, or to Mr. Frank L Burns, Berwyn, Penn.

EDITORIAL.

This issue of the Bulletin will follow some of you to the field of your summer outing, and will find others in the midst of preparations for carrying out the plans for the summer. To such, and to all, we wish to offer this word of greeting, and this expression of the hope that the summer may be full of all best things. May one of the best things be some new information of the lives of some birds.

Studies of the birds in the summer are not usually pursued with the vigor which is given to studies of the migrations, because of the natural difficulties which summer conditions present. It is for that reason that we urge more persistent study on the part of all during this time. Did you ever notice that most of our bird literature is either strangely silent or at least very general in statements about the summer habits of most birds? The summer field is such an untrodden one that one cannot enter it without the assurance that new facts await him. Surprises quite as exciting as any which the migrations bring await the summer student of the birds Plan your work for it this once.

The editor spent a delightful three days with Dr. W. E. D. Scott and his family of birds at the newly established Worthington Society for the Investigation of Bird Life; at Shawnee-on-Delaware. early in May. He never before saw our native birds so thoroughly contented and normal in their captivity that it was impossible to tell the captives from the wild birds which alighted upon the cages.

except that the captives seemed to be the better favored. If one were inclined to conscientious scruples against keeping wild birds in confinement the sight of this happy and contented family would certainly sweep the scruples away. We feel a lasting gratitude to Mr. Worthington for his interest and liberality in making this venture possible, and we heartily congratulate Dr. Scott upon the beginning of a realization of the fruition of a life given to a greatly needed work such as he has undertaken. May his work prosper and his days be multiplied to carry forward this work.

Carefully prepared lists of summer birds from regions not already fully covered by publis hed lists, are solicited. Faunal studies of this sort will be worth publishing until the country is fully covered, or until we have learned everything there is to learn about distribution. Along with any list there should go such notes relating to life histories as can be learned, particularly as to the close of the season of song, and exact dates of nesting. Copious notes made while one is working in the field with the birds are valuable assets. Often what seem to be purposeless notes at the time they are made later prove to be the key to the solution of some vexed question. The best memory may prove fickle.

Before the next number of the Bulletin goes to press the southward migrations will have begun. How much do we really know about when the southward movement begins in our own locality, or where we spend the summer? Isn't it worth while to begin to learn about it? Here on Lake Erie some of the sandpipers which nest about Hudson's Bay, supposably, are to be found on the sandy shores and in the mud flats early in July, and some of the warblers are evidently moving southward early in August. On the other hand, some birds seem to leave for the south before they actually do.

SOME NOTEWORTHY LORAIN COUNTY RECORDS FOR 1906.

A solitary White-throated Sparrow was found wintering in the gorge of Vermilion river near Brownhelm Mills, on January 1. The bird was clearly in good physical condition. This is the first recorded instance of the wintering of this species.

Hoyt's Horned Lark was again found, in company with Prairie Horned Larks, four individuals on February 22. The difference of coloration and size was marked. These four inclined to separate themselves from the others and grouped together.

A company of six Bronzed Grackles spent the winter in Oberlin. Two or more Robins were fed all winter in Oberlin.

Only two Lapland Longspurs have been recorded for the county —March 5. Many more are usually found during the spring weeks.

A solitary Snowflake was found feeding with a company of Prairie Horned Larks, on February 16. No others were seen during the winter.

A Kirtland's and a fine male Prairie Warbler were recorded on May 2. The birds were feeding close together and permitted an approach within twenty feet, singing all the time. The Kirtland's was without markings on the center of the breast. This is the third record for Kirtland's Warbler.

A solitary Hooded and a solitary Kentucky Warbler were recorded on May 15, both singing lustily. These birds have recently made their appearance in the county. Neither have yet been found except during the height of the spring migrations.

There was a notable scarcity of Goldfinches during the last week in March and the first three weeks in April. Only a few were recorded during the winter. The birds became common again by the 30th of April, and before any had completed the spring moult. A similar scarcity is reported to me from south-eastern Michigan. Were they common anywhere during this period?

SPECIAL PAPERS RECEIVED.

Cassinia, A Bird Annual. Proceedings of the Delaware Valley Ornithological Club of Philadelphia. 1905. Issued February, 1906.

On a Collection of Birds and Mammals from the Colorado Delta, Lower California. By Witmer Stone, with Field Notes by Samuel N. Rhoads. From the Proceedings of The Academy of Natural Sciences of Philadelphia, September, 1905. Issued December 6, 1905.

On a Collection of Birds from British East Africa obtained by Mr. George L. Harrison, Jr. By Witmer Stone. From the Proceedings of The Academy of Natural Sciences of Philadelphia, November, 1905. Issued January 24, 1906.

The Mammals of Colorado. By Edward R. Warren. Colorado College Publications, General Series No. 19.

CURRENT PUBLICATIONS RECEIVED.

American Ornithology, Vol. V, No. 12; Vol. VI, Nos. 1 to 5.
Bird-Lore, Vol. VII, No. 6; Vol. VIII, Nos. 1, 2.
Boys and Girls, Vol. V, Nos. 3 to 6; Vol. VI, Nos. 1 to 5.

Bulletins 233 to 237, Michigan Agricultural College Experiment Station.

Condor, The, Vol. VII, No. 6; Vol. VIII, Nos. 1, 2.

Journal of the Maine Ornithological Society, Vol. VII, No. 4; Vol. VIII, No. 1.

Nature-Study Review, Vol. II, Nos. 1, 2.

Ornithologisches Monatschrift, Vol. XXX, Nos. 9 to 11; Vol. XXXI, Nos. 1 to 6.

Monthly Bulletin, The Pennsylvania State Department of Agriculture, Vol. III, Nos. 6 to 12.

Oologist, The, Vol. XII, Nos. 11, 12; Vol. XIII, No. 1.

Ohio Naturalist, The, Vol. VI, Nos. 2 to 7.

Ontario Natural Science Bulletin, The, No. 2.

Zoological Society Bulletin, Nos. 19, 20, 21.

NOTICES OF RECENT LITERATURE.

I. Birds from Mindoro and Small Adjacent Islands.

II. Notes on Three Rare Luzon Birds.

By Richard C. McGregor. Bureau of the Government Laboratories. No. 34. October, 1905. With 18 plates and 27 figures.

These two papers continue the excellent work which Mr. McGregor is doing toward completing our knowledge of the birds of our far eastern island possessions. Three new species are described, and much information concerning life history and more extensive descriptions of plumages are given. L. J.

A Hand-List of the Birds of the Philippine Islands. By Richard C. McGregor and Dean C. Worcester. Bureau of the Government Laboratories, No. 36, January, 1906.

This "Hand-List" follows the form of Dr. R. B. Sharpe's "Hand-List of Birds." Dr. Worcester prefaces the Hand-List proper with an interesting and valuable discussion of the zoological relationships of the islands among themselves. The Hand-List is concerned chiefly with giving the names of the species and their distribution. Additional information is supplied in foot-notes where it seems called for. There is a complete index to genera and species, and another index to the orders, suborders, families, and sub-families of the Philippine birds. It is a valuable and timely contribution to ornithological literature. L. J.

The Grouse and Wild Turkeys of the United States, and Their Economic Value. By Sylvester D. Judd. Bulletin No. 24, Biological Survey, U. S. Department of Agriculture.

In this valuable paper Dr. Judd gives us the distribution, food habits, and methods for preservation and propagation of this group of game birds. Especial attention is called to the great economic

value of the grouse and wild turkeys, both from their habit of eating insects and weed seeds, and because of their value as an article of diet. It is earnestly to be hoped that active measures will at once be taken to repopulate the regions now depopulated by these birds, which were once well stocked. L. J.

Bird Photography in Norway. By R. W. Shufeldt. Reprint from The Popular Science Monthly, May, 1906.

Dr. Shufeldt here gives us a delightful glimpse of Norway bird life in pen and camera pictures. Certainly Norway is not a whit behind America in catching the birds with the lens. L. J.

An Ecological Survey in Northern Michigan. Prepared under the direction of Chas. C. Adams. A Report from the University Museum, University of Michigan, published by the State Board of Geological Survey as a part of the Report for 1905. Copiously illustrated with maps and half-tones.

This ecological study covers "the plant and animal life of the Porcupine Mountains in Ontonagon County and on Isle Royale." The Porcupine Mountains were studied from July 11 to August 13, and Isle Royale from August 13 to September 5. As far as the birds were concerned they were seen only under the conditions of fall migration. Eighty-nine species of birds were recorded on the Porcupine Mountains, and 81 on Isle Royale. It is to be hoped that this work can be supplemented by studies during the breeding season of the birds. L. J.

We are pained to learn of the death of our fellow member, a sketch of whose life from the pen of one of his close associates is here quoted from a local paper.

"Alternately reciting the apostle's creed and repeating parts of the Lord's prayer the soul of LaRue K. Holmes, son of Colonel B. P. and Georgiana K. Holmes, passed to its eternal reward. The end came suddenly at his home on Pine Grove avenue, early Thursday morning. The immediate cause of death was rheumatism of the heart complicated with other weaknesses. Though a young man of quiet, studious tastes, young Holmes was well known in Summit, N. J., and his death will come as a shock to his many friends.

"Born December 2nd, 1883, he was little over twenty-two years of age. At an early age he became a communicant in the Episcopal church and died in that fellowship. A profound lover of nature, he developed while still a boy into a zealous student of natural history. Botany, entomology, and ornithology claimed his attention according to his varying mood. He could not cross a field or pass through a belt of timber without exploring hidden nooks for specimens of interest to the naturalist.

"His great passion was for birds, whose habits and habitat he studied with unwearied interest. Had he lived he might have won distinction as an ornithologist. Already he had served as curator in the museum of Natural History, New York, and achieved honorable mention for his work in classifying the recent accessions to their department of ornithology. He was also a correspondent of the Smithsonian Institute at Washington, and exchanged specimens with them. Though affable and gracious in manner, he was naturally reserved and preferred solitude to society. His bereaved mother and father will have the sympathy of this entire community in an affliction which removes their last child and leaves their home without one for whom they lived and labored."—W. W. Giles.

It is my sad duty to chronicle the death of our fellow member, LaRue K. Holmes, at Summit, N. J., on May 10th, 1906, at the home of his parents, Colonel B. P. and Georgiana K. Holmes. The following touching note from the bereaved mother gives the particulars far more fittingly than pen of mine:

DEAR SIR:—Our precious LaRue, recently assistant curator at the Museum of Natural History, New York, entered into rest yesterday, after intense suffering for four months, from rheumatism of the heart, singing a hymn and repeating the Apostles' creed and Lord's Prayer. Patient beyond words, almost unspotted by contact with the world, artistic in nature and devoted to the study of his beloved birds, he passed to the spirit world in triumph through Christ.

Yours, in sorrow, which should be rejoicing.

GEORGIANA KLINGLE HOLMES.

He was elected an associate member of the American Ornithologists Union in 1902, and a corresponding member of the Delaware Valley Ornithological Club in 1904, and his most elaborate paper, "The short-billed Marsh Wren (*Cistothorus stellaris*) in Eastern Pennsylvania and New Jersey," in the Cassinia for 1904, suggests careful and critical research and exceptional ability.

The writer had the pleasure of meeting him at a gathering of ornithologists in Philadelphia a few years since and found him quiet, affable, enthusiastic, peculiarly attractive, and soon after entering into correspondence with him, induced him to join the Wilson Ornithological Club as an active member. He contributed an excellent paper entitled "The Summer Birds of Summit, Union County, N. J.," to the WILSON BULLETIN for March, 1905. In their bereavement for this their last child, the sorrowing parents will have the sympathy of all the members of the Wilson Ornithological Club.

FRANK L. BURNS.

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SCREECH OWL (Megascops asio)
young of the year.